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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/705,729	11/06/2000	Yoshinori Shizuno	OKI 267	7911

23995 7590 10/08/2002

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EXAMINER

FARAHANI, DANA

ART UNIT PAPER NUMBER

2814

DATE MAILED: 10/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/705,729

Applicant(s)

SHIZUNO, YOSHINORI

Examiner

Dana Farahani

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 July 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/19/02 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (U.S. 6,184,580), previously cited, in view of Dibble et al., hereinafter Dibble (U.S. Patent 6,040,631), newly cited.

Lin discloses in figure 2, a semiconductor device comprising a semiconductor chip 20; thin wires 27 and 25 are respectively connected to electrodes on the semiconductor chip; a wiring board 36, having an opening (in the middle of section 32) for accommodating the chip, and electrically connected to the semiconductor chip by the wires; a heat spreader 26 equipped with the semiconductor chip; and an adhesive layer 24 bonds the chip and the wiring board; and an encapsulating resin 51 for sealing the wires, wherein the chip is disposed in the opening of the wiring board, and is separated from edges of the wiring board, and the chip does not completely cover the heat spreader within the opening. Furthermore, Lin discloses layer 38 is also an adhesive (see column 4, line 7).

Lin does not disclose a portion of the heat spreader within the opening that is not covered by the semiconductor chip being completely covered by the adhesive layer.

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Dibble discloses in figure 3, an opening in the middle of the wiring board 26, heat spreader 12, wherein chip 14 and adhesive 16 and 18 of figures 1 and 2, respectively, are in the opening, and a portion of the heat spreader within the opening that is not covered by the semiconductor chip being completely covered by the adhesive layer in order to improve thermal conductivity of the chip to the heat spreader (see column 2, lines 30-44).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Dibble's structure in Lin's structure in order to improve thermal conductivity of the chip to the heat spreader.

3. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin, as applied to claim 1 above, and further in view of Yamagata et al., hereinafter Yamagata (U.S. 5,828,127), previously cited.

Lin discloses the claimed invention except a second adhesive layer and a radiating fin.

Yamagata discloses in figure 13, adhesive 20 and fin 19 to improve heat releasing capability (see column 19, lines 31-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this structure in Lin's invention in order to further improve heat dissipation, and further use a second adhesive layer with the same thermal characteristic as the first adhesive layer since the adhesive would have been readily available.

4. Claims 5-7, 9, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Yamagata, and further in view of Moscicki, (U.S. 6,064,115), previously cited, and further in view of Shin (U.S. Patent 5,807,768), newly cited.

Regarding claims 5-7, Yamagata, as applied to Lin, renders obvious the claimed invention, as above discussed, except for resin encapsulating for adhesive layer 20; and sealing the metal thin wires with a second different encapsulating resin after a first encapsulating resin, which seals the chip, has been cured.

Moscicki discloses in column 5, lines 23-29, that encapsulating resin is injected, as part of the packaging process in order to make a semiconductor package. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use resin section for the second adhesive layer and the part of the chip to further bond the device.

Shin discloses in figure 2 a first encapsulate 6a, and a second encapsulate 7a, sealing the metal wires, are provided for the chip package in the figure. Furthermore, Shin discloses the first encapsulate is cured before the second one is added (see column 10, lines 29-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use two encapsulates in order to attach the chip to the heat sink firmly, with a first stronger encapsulate than the second encapsulate to be disposed on the wires, without affecting the wires.

Regarding claim 9, Lin in view of Yamagata, and further in view of Moscicki, and further in view of Shin renders obvious the claimed invention, as above discussed, except for connecting electrodes after the sealing and second adhesive layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to connect the electrodes after the sealing and second adhesive layer and before the sealing the wires in order to avoid damaging the wires.

Regarding claim 10, in Shin, wires 5 are attached prior to the first sealing (see column 5, lines 6-18). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to attach wires prior to the first sealing to use the structure in Lin's invention.

Response to Arguments

5. Applicant's arguments filed 7/19/02 have been fully considered but they are not persuasive.

6. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e. a portion of the heat spreader within the opening that is not covered by the semiconductor chip is completely covered by an adhesive layer) are not recited in the previously rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

7. Regarding applicant's argument that "performing a second sealing portion after a first encapsulating resin has been cured" is in none of the references, this process is in Shin reference, as above discussed.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

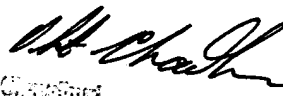
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (703)305-1914. The examiner can normally be reached on M-F 9:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703)306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Dana Farahani
September 30, 2002


G. H. Chaudhri
Supervisory Patent Examiner
Technology Center 2800